Operational Fires -- What's In A Name?

A Monograph
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Fort Leavenworth, Kansas

Second Term, AY 89/90

UNCLASSIFIED
SECURITY CLASSIFICATION OF THIS PAGE

REPORT DOCUMENTATION PAGE

Form Approved OMB No. 0704-0188

1a. REPORT SECURITY CLASSIFICATION UNCLASSIFIED	1b. RESTRICTIVE MARKINGS
2a. SECURITY CLASSIFICATION AUTHORITY	3. DISTRIBUTION / AVAILABILITY OF REPORT Approved for public release; distribution is unlimited.
2b. DECLASSIFICATION / DOWNGRADING SCHEDULE	
4. PERFORMING ORGANIZATION REPORT NUMBER(S)	5. MONITORING ORGANIZATION REPORT NUMBER(S)
6a. NAME OF PERFORMING ORGANIZATION School of Advanced Military Studies, USACGSC 6b. OFFICE SYMBOL (If applicable) ATZL-SWV	7a. NAME OF MONITORING ORGANIZATION
6c. ADDRESS (City, State, and ZIP Code) Fort Leavenworth, Kansas 66027-6900	7b. ADDRESS (City, State, and ZIP Code)
8a. NAME OF FUNDING / SPONSORING ORGANIZATION 8b. OFFICE SYMBOL (If applicable)	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER
8c. ADDRESS (City, State, and ZIP Code)	10. SOURCE OF FUNDING NUMBERS PROGRAM ELEMENT NO. / PROJECT NO. / TASK NO. / WORK UNIT ACCESSION NO.

11. TITLE (Include Security Classification)
Operational Fires -- What's In A Name? (Unclassified)

12. PERSONAL AUTHOR(S)
Lieutenant Colonel William J. Rice, U.S. Army

13a. TYPE OF REPORT	13b. TIME COVERED	14. DATE OF REPORT (Year, Month, Day)	15. PAGE COUNT
Final; Monograph	FROM _____ TO _____	7 May 1990	54

16. SUPPLEMENTARY NOTATION

17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
FIELD	GROUP	SUB-GROUP	Operational Fires Interdiction

19. ABSTRACT (Continue on reverse if necessary and identify by block number)

The concept of "operational fires" has been proposed within the Army as one of several operating systems at the operational level of war in the same sense that Battlefield Operating systems have proven useful at the tactical level. However, the concept has not been so warmly received and applied outside of the Army. In fact, the term appears nowhere in joint doctrine. The purpose of this monograph is to contribute to the clarity of thought concerning operational fires through an examination of its theoretical, practical and historical basis.

The monograph reviews classical theory in establishing a theoretical foundation for operational fires. More contemporary views of Soviet and NATO practitionars are presented to accommodate the influence of advancing technology on operational fires.

The study proceeds with an investigation of several historical examples offering insights into the nature of operational fires. In particular, Operations Overlord, Cobra and the Soviet Vistula-Oder Campaign from World War II and the 1967 Arab-Israeli Conflict reveal important common characteristics concerning operational fires. (Continued on reverse)

20. DISTRIBUTION / AVAILABILITY OF ABSTRACT	21. ABSTRACT SECURITY CLASSIFICATION
☑ UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT. ☐ DTIC USERS	UNCLASSIFIED
22a. NAME OF RESPONSIBLE INDIVIDUAL WILLIAM J. RICE	22b. TELEPHONE (Include Area Code) 913-684-3345 / 22c. OFFICE SYMBOL ATZL-SWV

DD Form 1473, JUN 86 *Previous editions are obsolete.*

SECURITY CLASSIFICATION OF THIS PAGE
Unclassified

Block 19 (Continued)

Following some analysis of the emerging consistencies found in theory and history regarding operational fires, the following revised definition is proposed:

> Operational fires are defined as the application of firepower, often the product of coordinated joint and/or combined effort, directed by the operational commander as a fully integrated component of his campaign plan (operational concept), with design and intent to achieve a specified, high impact, operationally significant result through focussed intelligence and targeting and effective massed and/or precision fires.

The monograph concludes with a brief discussion of several implications of this definition, generally expressing concerns over designation of a responsible agent for the conduct of operational fires, and the effectiveness of intelligence and targeting support for operational fires.

School of Advanced Military Studies
Monograph Approval

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Accepted this 7th day of June 1990.

ABSTRACT

OPERATIONAL FIRES -- WHAT'S IN A NAME?
by Lieutenant Colonel William J. Rice, USA, 50 pages.

The concept of "operational fires" has been proposed within the Army as one of several operating systems at the operational level of war in the same sense that Battlefield Operating Systems have proven their utility at the tactical level. However, the concept has not been so warmly received and applied outside of the Army. In fact, the term appears nowhere in contemporary joint doctrine. The purpose of this monograph is to contribute to clarity of thought concerning the concept of operational fires through an examination of its theoretical, practical and historical basis.

The monograph reviews classical theory as offered by Clausewitz, Sun Tzu, Douhet and Mitchell, and that interpreted by Soviets Tukhachevskii and Triandafilov in establishing a theoretical foundation for operational fires. The more contemporary views of several Soviet practitioners and those of Generals Rogers and von Sandrart from NATO are presented in order to accommodate the influences of advancing technology on operational fires.

With the theoretical basis thus established, and using a "straw-man" definition for operational fires as a point of departure, the monograph proceeds with an investigation of several historical examples which offer insights into the nature of operational fires. In particular, Operations Overlord, Cobra and the Soviet Vistula-Oder Campaign from World War II and the initial phase of the 1967 Arab-Israeli Conflict are the selected examples which reveal some important common characteristics concerning operational fires.

Following some analysis of the emerging consistencies found in theory and history regarding operational fires, the following revised definition is proposed:

> **Operational Fires are defined as the application of firepower, often the product of coordinated joint and/or combined effort, directed by the operational commander as a fully integrated component of his campaign plan (operational concept), with design and intent to achieve a specified, high impact, operationally significant result through focussed intelligence and targeting and effective massed and/or precision fires.**

The monograph concludes with a brief discussion of several implications of this definition, generally expressing concerns over designation of a responsible agent for the conduct of operational fires, and the effectiveness of intelligence and targeting support for operational fires.

Table of Contents

> **Operational Fires ... is the application of firepower to achieve a decisive impact on the conduct of a campaign or major operation. Operational fires are by their nature joint/combined activities or functions. They are a separate component of the operational scheme and the coequal of operational movement and maneuver ...**
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> **TRADOC PAM 11-9** [Draft] (32,4-4)

The concept of "operational fires" has been proposed within the Army as one of several operating systems at the operational level of war in the same sense that Battlefield Operating Systems have proven very useful at the tactical level of war. As indicated above, operational fires are considered, at least by some, to hold a preeminent position (coequal with maneuver) in operational thought, and they are viewed as inherently joint and/or combined in character.

It is interesting to note that, although the concept of operational fires appeared in Army literature as early as 1987, there is even today, amidst a virtual explosion in the creation of joint doctrine, no mention of the concept in either joint or sister service doctrine or literature. In fact, some in the joint community would argue that the concept of operational fires is an ill-conceived attempt from within the Army to take a useful tactical principle and, by extension, introduce it as an operational level axiom. So, at the very least, there is some controversy about the merits of including fires as a consideration in campaign planning at the operational

level of war. Further, a review of applicable Army doctrine, some still in draft, reveals that the treatment given to the definition and application of operational fires is inconsistent.

The purpose of this paper is to contribute to clarity of thought concerning the concept of operational fires by:

(1) exploring theory and history for lessons and insights confirming or discounting the importance of fires as a consideration at the operational level of war,

(2) determining which, if any, of the several existing definitions captures the essence of the concept that emerges from those same lessons and insights, or proposing and justifying an alternative definition, and

(3) identifying any implications of the chosen definition toward emerging joint doctrine addressing fires.

The question at hand, then, is "What precisely are operational fires and how do they relate to emerging joint doctrine about the application of firepower?" With a generalized roadmap for the paper thus established, it remains only to relate the criteria to be used in evaluating and possibly revising the definition of operational fires.

The Standard College Dictionary offers that to

define is to state precisely the meaning or to describe the nature and properties of a word, phrase or concept (34,350). What does this somewhat subjective definition contribute toward recognizing or creating a suitable definition of operational fires? I would paraphrase key elements of the dictionary definition to assert that a suitable definition of operational fires must state precisely the nature and properties (capture the essence) of the concept itself. Further, to be both suitable and valuable, a definition of operational fires must:

1) be consistent with historical experience

2) capture the common threads from historical examples which would seem to yield reproducibility (i.e., identify the essential elements which, when present, enable or assure that the application of fires will achieve the intended operational impact.)

3) be unique -- distinct from other types of fires.

Just such a definition is sought in this study, which begins with a survey of military theory as it relates to the application of firepower.

Classical military theorists offer insights without cognizance of contemporary technology and its profound influence on the application of firepower. Despite this, some very useful thoughts can be gleaned

from classical military theory. Clausewitz, in On War, adheres throughout to the primacy of the destruction of the main enemy force as the constantly compelling objective in war. However, he allows that engagements for other purposes than the immediate destruction of enemy forces may retain significant utility, particularly as such engagements might contribute to establishing conditions leading up to a decisive battle (3,181). Such engagements

> may do so by a circuitous route, but are all the more powerful for that. The possession (or destruction) of provinces, cities, fortresses, roads, bridges, munitions dumps, etc, may be the immediate objective of an engagement, but can never be the final one. Such (activities) should always be regarded merely as a means of gaining greater superiority, so that in the end we are able to offer an engagement to the enemy when he is in no position to accept. (3,181)

Thus Clausewitz acknowledges the potential value in attacking infrastructure and logistical stocks and support, aimed particularly at the destruction of enemy warfighting capability (3,515). Such targets are susceptible to attack with fires today. However, he cautions that these sorts of attacks will not of themselves be decisive.

While maneuver and tactical, direct fires were the primary tools of warfare in the era of which Clausewitz wrote, On War reflects an appreciation of depth on the battlefield which can be exploited today with fires. In the cybernetic domain, Clausewitz wrote that the risk of having to fight on two fronts, and the

even greater risk of finding one's retreat cut off, tend to paralyze movement and the ability to resist, and so affect the balance between victory and defeat (3,233). Certainly in his day, maneuver was the means to tip this balance, but today the application of fires can contribute as well. Further, Clausewitz recognized the occasional necessity of attacking and reducing fortresses in order to proceed with an attack in depth (3,551). In his time, the allocation of forces to conduct a siege might have been the only means to facilitate or enable the conduct of maneuver in depth. By extension, fires have been used subsequent to the time of Clausewitz and may be used today to reduce fixed defenses or installations and thus facilitate operational maneuver. While he is certainly among the preeminent theorists, Clausewitz was neither the only nor even the earliest classical military theorist to offer useful insights toward the operational application of firepower.

Sun Tzu, from the historical perspective of a much earlier time, demonstrated considerable prescience in The Art of War as he made observations which are pertinent to the application of firepower. In particular, Sun Tzu observed that

> There are five methods of attacking with fire. The first is to burn personnel; the second, to burn stores; the third, to burn equipment; the fourth, to burn arsenals; and the fifth, to use incendiary missiles (12,141).

Of course, the modern concept of firepower and Sun Tzu's notion of attacking with fire differ markedly, but the choice of appropriate targets and the reference to incendiary missiles are of considerable interest. Sun Tzu's concept of the normal, direct or "cheng" force and the extraordinary, indirect or "ch'i" force are significant. His view was essentially maneuver based, with the "cheng" force serving as a fixing element and the "ch'i" force as a flanking or encircling element (12,42). The beauty of the concept of "cheng" and "ch'i" is that the roles of the two can reverse based upon opportunity -- either force may turn out to be the force of distraction or of decision. And as Sun Tzu pointed out, "In battle there are only normal and extraordinary forces, but their combinations are limitless; no one can comprehend them all"(12,92). Again, although Sun Tzu's concept of "cheng" and "ch'i" rested on the assignment of roles to maneuver forces, it is only a short conceptual leap to assign such a role to indirect firepower, or electronic warfare, or to any of a number of other modern warfighting capabilities, adding vast new dimensions to the realm of possibilities in war. While Sun Tzu did not speak of the operational level of war, he did specify that "cheng" and "ch'i" forces are instruments which belong to the General, the overall commander (12,42), and that "cheng" and "ch'i" operations may be launched on

strategic as well as tactical levels (12,42).

Recognizing that classical military theorists offer a context within which, by extension, the application of firepower over broad dimensions of space and time fits nicely, we must turn to more contemporary thought for insights into how emerging technology in fires might best be employed to achieve its fullest potential. In the wake of frustration with the static warfare that evolved in World War I, great energy and innovation was directed toward the problem of how to restore maneuver to the battlefield and/or how to win despite the maneuver stalemate that had developed. Amidst this flurry of effort, Guilio Douhet brought forth his vision of the employment of then fledgling air power to achieve decisive strategic results.

Douhet captured the excitement of the change he foresaw in observing that:

> civilian populations of warring nations (in World War I) did not directly feel the war. No enemy offensive could menace them beyond (some) predetermined distance, so civilian life could be carried on in safety and comparative tranquility. The battlefield was strictly defined; the armed forces were in a category distinct from civilians, who in turn were more or less organized to fill the needs of a nation at war. ... And so, though the World War affected whole nations, it is none the less true that only a minority of the people involved actually fought and died. The majority went on working in safety and comparative peace to furnish the minority with the sinews of war. This state of affairs arose from the fact that it was impossible to invade the enemy's territory without first breaking through his defensive lines. But that is a thing of the past; for now it is possible to go far behind the fortified lines of defense without first breaking through them. It

is air power which makes this possible. (4,9)

Douhet went on to observe that, although the net destruction felt in World War I was tremendous, nations were able to sustain their struggles because fighting was sporadic and protracted. This made it possible to replace losses to the point of exhaustion.

> Never...was a death blow struck -- a blow which leaves a deep gaping wound and the feeling of imminent death. Instead, both sides struck innumerable blows and inflicted many wounds; but the wounds were light ones and always (allowed) time to heal. ... There is no doubt now that half the destruction wrought by the war would have been enough if it had been accomplished in three months time instead of four years. A quarter of it would have been sufficient if it had been wrought in eight days. (4,14)

Here Douhet introduces what becomes one of his primary axioms for the employment of aerial fire power -- "Inflict the greatest damage in the shortest possible time"(4,51). Clearly, Douhet recognized and emphasized the importance of achieving high impact as a result of the application of firepower. To that end, Douhet was a staunch proponent of independent air forces with charter to operate in mass against significant military and civilian targets (4,49). However, Douhet's was not the only voice speaking out for independent air forces and massive employment of air power.

In the inter-war years, Billy Mitchell was a major influence on the emergence of the air arm in the United States. His theories bore strong resemblance to Douhet's, though he was less inclined toward the attack

of civilian population centers, asserting that such targets ought be attacked "only as an act of reprisal" (6,81). He did envision that great impact would be achieved through massive air attack and destruction of the following military and civilian targets of military significance:

> enemy aerodromes, concentration centers (massed forces), training camps, personnel pools, transportation centers, whether train, road, river or canal, ammunition and supply dumps, headquarters of staff commands, forts and heavily fortified positions, trains, columns of troops, bridges, dams, locks, power plants, tunnels, telephone and telegraph centers, manufacturing areas, water supplies and (even) growing grain. (6,81-82)

Although prominent among theorists addressing air employment during the inter-war years, Douhet and Mitchell were certainly not the only active influences in the field. In fact, in reflecting upon the development of industrial or strategic bombardment doctrine for the U.S. Army Air Corps prior to World War II, it is noted that:

> so difficult to unravel is the tangled skein of sources and influences out of which Air Corps bombardment doctrine coalesced that the Tactical School's conclusions on war strategy cannot be attributed to any one person or even any one group of persons, nor any one nation or any single decade. (13,17)

While the origins of U.S. Army Air Corps doctrine are many and varied, its content is of great interest, and is summarized as follows:

> The most efficient way to defeat an enemy is to destroy, by means of bombardment from the air, his war making capacity; the means to this end is

> to identify by scientific analysis those particular elements of his war potential the elimination of which will cripple either his war machine or his will to continue the conflict; these elements having been identified, they should be attacked by large masses of bombardment aircraft flying in formation, at high altitude, in daylight, and equipped with precision bombsights that will make possible the positive identification and destruction of "pin point" targets; finally, such bombing missions having been carried out, the enemy, regardless of his strength in armies and navies, will lack the means to support continued military action. (13,7)

Targeting through "scientific analysis...of...war potential" is an important evolution which bears considerable resemblance to attacking the Clausewitzian "center of gravity" with fires. However, as already noted, Clausewitz would likely argue that the defeat or destruction of targets other than the main enemy forces, while they may contribute to a decisive result, will not be decisive of themselves. Another notable element of this early U.S. Army Air Corps doctrine involves the reference to "pin point" targets. While Douhet, Mitchell and others have clearly made the case for massing air power to achieve high impact effects, it is suggested that, with advancing technology (bomb sights), precision delivery techniques will enhance or even supplant some requirements for mass.

During the years between World Wars I and II, the striking potential of air power and the increasing range and lethality of surface delivered fires was not lost on the Soviets, who have long been deeply committed students of warfare. It was Marshall Mikhail

N. Tukhachevskii, a preeminent architect of modern Soviet military thought, who observed that

> The waging of war by the old methods, by conventional forms of strategic employment ... is no longer possible. The side which is not poised to destroy enemy air bases, to disrupt his railway system, to mobilize and concentrate strong airborne forces, and to act swiftly with mechanized formations ... will not be able to achieve the required strategic concentration and will lose the principal theaters of operations. The nation which, in this year of 1934, neglects to embark on a radical strengthening of its air power will suddenly and unexpectedly find itself in a menacing predicament. (10,43)

He further held that the application of firepower on a mass scale made possible the simultaneous attack and destruction of the full depth of an enemy's tactical defense (10,39). In particular, firepower made it possible to neutralize enemy defensive systems to the extent that artillery and machine guns are rendered inutile in support of the defense, and further, to disrupt command and control and pin down reserves to the point that the various echelons of the enemy defensive layout can be destroyed in detail. (10,39)

Tukhachevskii's thoughts reinforced those of Vladimir K. Triandafilov, another of the founding fathers of Soviet military thought. One of Triandafilov's key lessons from the World War I experience was the recognition of the need for huge quantities of artillery in order to achieve successful breakthrough of positions held by infantry armed with heavy weapons of modern war (2,46). He also envisioned

the requirement for mobile artillery so that it could accompany advancing troops through the enemy defense and maintain depth of fires (2,46).

Triandafilov's views were supported, in turn, by a milestone article published by a Soviet General Golovin in 1925. His analysis of World War I experience stressed that artillery was more important than ever before in preserving one's own freedom of maneuver and denying it to the enemy. He posited that maneuver meant above all maneuver by fire, and the most important guarantee of this was long range (2,44). Golovin prescribed that the role of the artillery was to support infantry, deliver counterbattery fires, deliver chemical fires and cooperate with aircraft in the delivery of fires (2,45). The only missing element from contemporary Soviet thought on the role of artillery is that of clearing the way for armor (2,45).

Based largely upon these influences, the Soviet Army launched a colossal build up of its artillery arm in the 1930's, and the high proportion of artillery to other arms in the Soviet Army as compared to western counterparts and the emphasis on long range systems remains even today (2,46). Clearly, as a product of the thought and analysis emerging from the inter-war years, the application of fires in depth came to occupy a position of theretofore unknown prominence, rivaling maneuver in importance at the tactical level and

posturing to displace it at the operational level of war. What, then, is found in military literature about the employment of fires at the operational level war? We must turn to the more contemporary insights of theorists/practitioners to address that issue.

Based upon analysis of World War II experience, a concept that emerged in Soviet military thought about the application of firepower was termed the "fire strike". The Soviets defined a fire strike to be the delivery of powerful, paralyzing blows by artillery, rockets and air in a massive surgical strike to excise one element of the enemy's capability or defense (2,175-76). Thus was created a "new" term and an innovative application of fires. Or was it? In 1980, Soviet Marshall Peredel'skiy wrote that there really was no need for this new type of fire. His view was that the fire strike "was simply the operational level employment of Artillery (fires)" (2,176). The definitive statement, from the Soviet point of view, appeared in the Soviet Army newspaper "Red Star" in 1982.

> A fire strike might be preemptive, meeting or retaliatory, and is clearly a very large operational level act, but one which, by definition, uses only conventional fires. (2,176)

It is clear that the Soviets consider the application of firepower an important consideration in the conduct of operational art.

The Soviets are not alone in their belief that the application of firepower has profound significance at the operational level of war. From the other side of what once was the "Iron Curtain", General Bernard Rogers, former Supreme Allied Commander Europe, and General Hans Henning von Sandrart, Commander, Allied Forces Central Europe have expressed similar views. General Rogers writes that

> The ... factor ... that made deep strike concepts possible is the emerging conventional technologies. The value of striking deep behind (enemy) lines had always been recognized ... The problem was that it was very difficult to acquire the moving tank columns of the reinforcing ... forces and once acquired, they were difficult to hit with the "dumb" munitions that were available. ... (E)merging technologies ... make it possible not only to acquire mobile targets deep in the enemy rear and to process target data in real time, but through the use of terminally guided submunitions, to attack these moving targets successfully as well. (18,28)

In addressing the theory which exploits this emerging capability to successfully execute deep fires, General von Sandrart states

> (W)e must set our own operational intent against the enemy's concept and disrupt his plans as soon as possible ... Effective attack on follow-on forces and key targets in depth are a prerequisite to this end. (22,10-11) At the operational level, primary emphasis is on disrupting the "plans" of the enemy higher commands and on carrying through our own operational intent. Various measures serve this aim, such as preventing the enemy from bringing up fresh forces as planned and inflicting substantial losses on troops that are ready to be introduced in breakthrough sectors. In addition, command and logistics need to be hampered, thus reducing their effectiveness. (22,11)

General von Sandrart holds that such operationally

significant tasks may be accomplished through the application of firepower, exploiting the new technologies cited by General Rogers. However, General von Sandrart cautions that such targets must be attacked effectively in accordance with the operational concept of the ground forces commander. As such, the choice of time and place best suited for the attack is of critical importance (22,12). He concludes that these factors establish the need for short-term reaction at the operational level of command and portend the significantly increased importance of friendly long-range firepower (22,12).

It is General von Sandrart's view that the battle in depth is integral to the planning and conduct of operations by land force commanders. Given the aim to ensure that the friendly operational intent is realized and that the attacking enemy will be destroyed in sequence, battle in depth is inherently a component of the conduct of operations (22,14). He concludes, "In the framework of warfare as a whole, (deep battle) is not independent, as there can be no isolated land or air war." (22,14) There is thus firm basis in both Soviet and western thought that the application of firepower in depth has both pertinence and great importance at the operational level of war.

At this point, with an excursion through military theory and the thoughts of several contemporary

practitioners, as may pertain to fires at the operational level, complete, the next task is to explore historical examples which offer insight into the nature of "operational fires". Before embarking on that journey, it seems necessary to offer some further clarification. Given that one of the quests in this paper is to ultimately determine a suitable definition for the concept of operational fires, it is nonetheless essential to offer the best available working definition of operational fires as a point of departure. A definition was offered at the very outset in this paper for its effect, but it is only one of several which may be found in the literature. In fact, in his research project while a student at the Air War College in 1988-89, Army Lieutenant Colonel Ralph Reece indicated some dissatisfaction with the lack of precision he found among available definitions of operational fires. As one of the issues in his research, he undertook to survey the available literature and offer the most representative definition. I believe his definition offers a sound point of departure for our continued study of this issue.

> "Operational Fires" are fires which have a decisive impact on a campaign or major operation. They are integrated with maneuver at the operational level and usually serve one or more of three purposes. They overwhelm the enemy at critical points facilitating operational maneuver; they interdict enemy forces that have not yet joined the tactical fight; or they destroy

> critical facilities or functions that will adversely affect the enemy's campaign plan. (8,10)

Armed with this definition and the discussion which preceded it, we shall continue with a look at some historical examples. The intent in each case is not to recount details of the campaigns overall, but to capture only those aspects of planning and execution which bear directly on a discussion of operational fires.

The first of the vignettes is drawn from the experience of the Allies in World War II in the conduct of the Normandy invasion, Operation Overlord. Planning and preparation for the Allied invasion of the European continent from Great Britain had its origins even earlier than 1 April 1942 when President Roosevelt accepted plans from the Joint Chiefs for the conduct of Operations Bolero (buildup) and Roundup (invasion). While Great Britain and the U.S. had trouble agreeing on a date for the invasion, in January of 1943 they were able to agree on concepts for conducting a Combined Bomber Campaign for the Allied Air Forces. Though national approaches to strategic bombing differed broadly, from the massive British night bomber raids to the U.S. efforts to conduct precision, high-altitude daylight bombing raids, the campaign was launched and did prove somewhat effective. It is significant to note that, as stated earlier, the Army

Air Corps did indeed take a scientific approach to planning for its bombing campaigns. In August, 1941, in an Air War Plans Division (AWPD) document designated AWPD/1, the newly created Air War Plans Division specified that Germany's electric power, transportation infrastructure and petroleum industrial base were vital and would be the focus of the bombing campaign aimed at her destruction (14,56).

At the Sextant Conference (Cairo-Tehran) in November-December 1943 the Allies finally agreed that the invasion should take place in May 1944. At this point planning and preparation proceeded full force. General Eisenhower was called upon almost immediately to determine the focus of the Combined Bombing Campaign in preparation for Overlord. The leadership of the Allied Air Forces was split on the issue. The British favored the conduct of a "Transportation Plan" aimed at airfields, rail, bridges and key roads on the continent to inhibit German ability to react to the invasion when it came. True to their advance planning, the Americans favored an "Oil Plan" which would literally shut down the German war economy and war effort (14,69). Eisenhower decided in favor of the Transportation Plan because he felt it had a better chance of success in the limited time available before the invasion (14,61). He did endorse the Oil Plan as worthy, and indicated that it should be executed after the success

of the Transportation Plan.

The Transportation Plan was executed from January to May of 1944 and with considerable effect. Within 500 kilometers of the invasion beaches there were approximately 100 airfields from which German planes might operate against invasion forces. Nearly all of these were significantly damaged (14,69). Another aspect of the air component of the plan involved the destruction of enemy radar installations between Ostend and the Channel Islands, to deny their assistance to German night fighters and to German coastal guns and ships. German radar effectiveness was dropped to 18% as a result of this effort (14,69). Significant effort went against roads, bridges and particularly rail lines. Despite its considerable impact, the program did not reduce the transportation infrastructure capacity below a level which would allow it adequate residual capability to support German requirements (14,63).

In May 1944, after the Transportation Plan was essentially complete, AEAF bombers began to attack Oil Plan targets in the heart of Germany. This proved extremely important, in that these attacks hurt the enemy more than anyone recognized at the time. The German war production chief, Albert Speer, said later that it was the oil raids in May 1944 that decided the war (14,69). Their effect was so great that, to resist

what w- seen as a direct threat to the Reich's ability to continue the war, what remained of the Luftwaffe had to stay in Germany to counter these raids or the threat thereof rather than go to France to counter an invasion (14,69).

While the Allied Expeditionary Air Force(AEAF) contributed mightily to the invasion through the Transportation Plan, deception, and the intense bombardment of the beaches themselves, these details pale against the significance of what was achieved by the Oil Plan attacks in the heart of Germany. A comparison of Allied and German air activity during the 24 hours of D-Day tells the story very well. During that period, the AEAF flew some 14,000(+) sorties (14,94). By contrast, captured German records indicate that Jagdkorps II, the tactical arm of Luftflotte 3 in the invasion area had only from 50 to 121 fighters available. Jagdkorps II recorded only 250 sorties against the Allied effort -- and none with substantial effect (14,94).

> Without such complete Allied air superiority, the unsubtle frontal assault that was the amphibious invasion could have had scant hope of success. The completeness of Allied air superiority and the limited cost of D-Day in Allied lives ... were paid for at other times and places. The Fw190s and Bf109s were not in France, but back in Germany, if they could fly at all, primarily because of (the successful)... daylight bombing of the Reich. In this and the other campaigns in which the AAF and RAF had prepared the way for the invasion, the Allied air forces had lost 12,000 air crewmen, and over 2000 planes in the two months preceding D-Day. (14,94)

There are several instructive points to be gleaned from this example. I posit that General Eisenhower served at the strategic and operational levels of command during the planning and conduct of the invasion. In that capacity, he was responsible for directing, among many other things, the execution of the successful Transportation Plan and Oil Plan and for insuring their integration into the overall plan for the invasion. Both plans, but particularly the Oil Plan, effected the application of firepower with operational level impact to set conditions for the successful invasion. Interestingly, the Oil Plan was strategic by design and intent, but produced major operational effect, while the Transportation Plan was completely operational in nature. While it is clear that these operational fires were important to the success of the landings, it does not seem that they were decisive. Too many other factors, not the least of which was the elaborate operational deception portraying a major invasion at Pas de Calais, played crucial roles in this success. Recalling Sun Tzu's thoughts on "cheng" and "ch'i", it is interesting to note how readily and with what impact the shift from the "Transportation Plan" to the Oil Plan was made, and how profound a role those fires played in the success of the invasion.

The next historical vignette of interest actually

took place less than two months after the Normandy invasion -- Operation Cobra, General Omar Bradley's 1st Army breaking out of the Normandy beachhead. Both the American and British governments feared a stabilizing of the front in France, with visions of World War I, almost as much as they feared failure to gain a foothold on the continent at the outset (14,114). A SHAEF G-3 estimate written on 31 May 1944 registered concern that, although the Allies could expect to have superiority in air and sea power, airborne lift and even armor, it would be many months before they could match the Germans in infantry, even if there were no opportunities for German reinforcement (14,114). Thus there was great pressure to break out and exploit the advantages of armored/motorized maneuver and air power.

However, the challenges and frustrations of unhinging a determined German defense in the very difficult Bocage country of Normandy produced the very stalemate that had been feared.

> The desperation of the Bocage deadlock had driven Bradley and his staff to a plan uncharacteristic of the American Army both in its emphasis on concentrated power on a narrow front for the breakthrough, and in its vision of the indirect approach and a possible envelopment of enemy strongpoints as eventual dividends of American mobility. Adversity indeed has its uses; it had pushed Bradley to contrive an excellent plan. (14,137)

To complement the massing of troops on a narrow front, Bradley's plan called for an overwhelming concentration of air support to enable the breakthrough (14,138). He

set conditions for success and safety in the bombing effort by requiring his army to attack south to positions just north of the St. Lo - Periers road, an east-west stripe which was readily identifiable from the air and would serve well both as a line of departure for ground forces and as a bomb line for the air forces (14,138). (See map at inclosure 1.)

Bradley was concerned in planning the bombardment of the great rectangle just south of the St. Lo - Periers road with insuring friendly troop safety as well as overwhelming effects on the enemy without disrupting the terrain to the point that it impaired maneuver. There was much discussion about when and how far soldiers would have to be withdrawn to the north to insure their safety during the bombardment. Certainly Bradley was reluctant to ask his troops to give up any hard won ground, and he wanted them to cross the line of departure as the bombing lifted. Ultimately, it was agreed that ground forces would be withdrawn 1200 yards north of the bomb line to insure their safety. Further, due to their greater control and accuracy, fighter-bombers were to be employed in attacking the zone 250 yards deep and 7,000 yards wide just south of the St. Lo -Periers road, using only strafing and light fragmentation bombs. Heavy bombers were to saturate an area one mile deep and five miles wide, just south of that to be attacked by the fighter-bombers. They too

were restricted to the employment of relatively light fragmentation bombs. Medium bombers were to follow, attacking enemy strongpoints. Bradley's remaining concern was that the bombers take a transverse approach to the target area, flying parallel to the St. Lo-Periers road, in order to lessen the possibility of fratricide. The airmen were dead set against this approach, insisting on a perpendicular approach to minimize their exposure to enemy fires. While Bradley thought he had gained their concurrence with his position on this issue, events later proved that was not the case. (14,138-151)

The "choreography" of fires planned to support Operation Cobra was remarkable. Aerial bombardment was to begin at H-80 minutes with 350 TAC fighter-bombers striking the narrow strip just south of "the road". This strike was to take 20 minutes. Then, 1,800 heavy bombers of the VIII Bomber Command were to saturate the area south of the fighter-bomber strip for 60 minutes. At this point, H-Hour, the fighter-bombers were to return to hit their strip again for 20 minutes, during which time the ground forces were to move to the line of departure in order to begin the attack just as the bombing ended. Ten minutes later, 396 IX Bomber Command mediums were to attack key installations in the southern half of the target area for 45 minutes. (14,151) In all, the heavy bombers were to drop 3,300

tons of high explosive and fragmentation bombs, the mediums, 137 tons of high explosives and 4,000 260 pound fragmentation bombs, and the fighter-bombers, 212 tons of bombs and a great amount of napalm (14,152).

LTG Collins' VII Corps Artillery was to supplement the aerial bombardment with preparatory fires. The Corps Artillery was reinforced with most of the artillery belonging to First Army -- 21 of the available 47 battalions, totalling 258 non-divisional guns. Collins had more than 1,000 guns in total, a very sizeable figure, but, unfortunately, his artillery was ammunition constrained. Although almost two months after the initial landings, logisticians were not yet able to meet the demanding requirements for artillery ammunition. As a result, the artillery was used almost exclusively in close support and counterbattery roles, and the operation depended more heavily on the success of the aerial bombardment. (14,152)

Despite the brilliance of the concept and detailed planning, the execution of the fires associated with Operation Cobra was problematic. The operation, scheduled for 24 July, was postponed at the last minute, but nearly 1,600 aircraft were launched prior to receiving notice of the postponement. Many were notified in the air and turned back. Still others found weather in the target area too poor to drop, and returned without action. However, 335 heavy bombers

did drop their ordnance, some inaccurately, and as a result, soldiers of the 30th Infantry Division suffered 25 killed and 131 wounded. Bradley was clearly upset by this and the fact that the bombers were operating perpendicular to "the road" rather than parallel as he thought the airmen had agreed. However, in order to restage for the following day rather than accept a significant delay for the AEAF to replan missions on another axis, Bradley accepted the perpendicular attack aspect. Tragically, when Cobra launched in earnest on 25 July, the bombs of 35 heavy bombers and 42 mediums again fell short of the target area, resulting in 111 American dead and 490 wounded.(14,152-53) Despite the horror of the fratricide on 24 and 25 July, General Bradley observed that

> This operation could not have been the success it has been without such close cooperation of the Air. In the first place, the bombardment which we gave last Tuesday (25 July) was apparently highly successful even though we did suffer many casualties ourselves. (14,161)

Once again, there are some significant insights into the nature of operational fires to be gleaned from this example. As the operational level commander, General Bradley envisioned the use of firepower to break the integrity of the German defense in the difficult Bocage country and allow a penetration to operational depths. He went to great lengths to integrate this application of firepower with maneuver, carefully working the safety standoff, the bomb line,

the type of ordnance to be employed and its effect on subsequent maneuver, timing, and delivery systems to best fit his concept. Despite the well known difficulties in execution, the result of this application of firepower, orchestrated at the operational level, was the successful conduct of operational maneuver. Once again, I would question that the fires were themselves decisive, but they certainly contributed to the successful penetration by ground forces which may have been the decisive factor in the campaign.

The next historical sojourn is to the Eastern Front in World War II seeking insight into the Soviet use of fires during their Vistula-Oder Offensive, 12 January-3 February 1945. The aim of this offensive, conducted by the 1st Belorussian and the 1st Ukranian Fronts, was to defeat German forces in Poland by concentrating to achieve penetration of what had become a stable defensive front, encircling, and then capturing or destroying major German formations. (See map at Inclosure 2.) The 1st Belorussian Front, under Marshall Zhukov, chose to make two major attacks, one out of the Pulavy bridgehead and the other from the Magnuchev bridgehead. The 1st Ukranian Front, commanded be Marshall Konev, was constrained by geography to make a single attack out of the Sandomierz bridgehead.

Both fronts achieved surprise over the Germans through the level of force concentrations they achieved before launching the attack. The 1st Belorussian front assembled 52% of its rifle forces and 70% of its armor for the attack from its two small bridgeheads. The 1st Ukranian Front concentrated fully 90 % of its rifle forces and armor in the Sandomierz bridgehead. (24,521) While the weather was not particularly suitable for aerial operations in either frontal area (24,523), both fronts were able to concentrate artillery to an almost unprecedented level. In fact, the density of artillery on key sectors exceeded that of any other Soviet operation in the war, save Kiev in 1943 (2,65). As an example, in the 8th Guards Army sector of 1st Belorussian Front, there were 350 artillery pieces per kilometer of front, of which 95% exceeded 76mm (2,65).

The extent to which Soviet front commanders directed activity in pursuit of their operational intent to achieve penetration and maneuver to operational depths to destroy the enemy is quite interesting. Zhukov planned to fire a 25 minute artillery preparation, followed by an attack or reconnaissance in force by 22 reinforced battalions and 25 reinforced companies. (24,521) If this attack faltered, Zhukov had planned an additional 70 minute artillery preparation followed by a moving barrage.

(2,66) Konev, on the other hand, planned a 67 minute artillery preparation, also integrated with tactical maneuver to achieve the penetration. At 45 minutes prior to the end of the preparation, Konev's plan was to halt the preparation and launch platoon level attacks, hundreds of them across the front, to seize key strong points. Those attacks were to be followed by an even more violent 15 minute series of barrage fires, after which the main attack would commence. (24,521)

Early on the morning of 12 January 1945, the Vistula-Oder Offensive was launched. By the concentrated mass of combat capability and the marriage achieved between fire and maneuver, the breakout from each of the three bridgeheads was startlingly successful, capturing momentum for the attacking Russians that they did not yield before driving completely across Poland. There are two significant points to be drawn from the actual execution of fires supporting the launching of the offensive. First, the massive artillery concentration assembled to support this operation enabled the establishment of task oriented groups of artillery at each level from regiment up. As an example, at 5th Shock Army a breakthrough group (for close support), a long range group (for counterbattery fires) and a rocket launcher group were formed, producing greater concentration of

effort and improved control. (2,66) This enabled ruthless concentration against particularly tough targets. In the case of one stubborn center of resistance in the Grabau region, 5th Shock Army's artillery commander concentrated the fires of three artillery brigades, 180 guns, on that single objective. After the Russian artillery had fired 1,150 shells in five minutes, resistance ceased. Secondly, an interesting aspect of the 1st Ukranian Front preparation is that it included a seven minute "fire strike" (discussed previously) during which the entire Frontal artillery massed fires exclusively on German batteries, anti-tank guns and observation posts. (2,66) The effect of this massive, carefully planned, targeted and executed blow was devastating to German capability to generate defensive firepower.

This historical excursion offers fresh insights into what seem to be some emerging consistencies. As with Operation Cobra, the operational commanders' intent was for fires to produce a rupture in static defenses through which a major offensive would be launched. On both fronts, the operational commander's contributions to insuring that fires would produce the desired result were twofold. First, the Front commander surprised his foe with massed/concentrated maneuver forces and artillery. The massed artillery was functionally organized so that the

full weight of its firepower could be brought to bear. Once again, the operational commander insured that the plan for the application of firepower was fully integrated in his operational scheme. In this case, the manner in which this integration was achieved is somewhat surprising in that it was the product of explicit direction by the Front Commander all the way to platoon level. As in Operation Cobra, the highlighted portion of the Vistula-Oder Campaign suggests that the impact of firepower was great and important to the outcome, but not demonstrably decisive.

The final historical vignette involves a brief look at the 1967 Arab-Israeli War. In the spring of that year, the Arab world was brought to a state of virtual hysteria by a sequence of events prompted by Soviet diplomatic collusion in the Mideast, and by inflammatory behavior on the part of President Nasser of Egypt. By 17 May, Nasser had massed 100,000 troops and over 1,000 tanks along Israel's southwestern border and he demanded the withdrawal of the United Nations Emergency Force. (5,149) For whatever reasons, U Thant, Secretary General of the U.N. acceded to the request within two days. Shortly thereafter Nasser had closed the Straits of Tiran to Israeli shipping and he had publicly declared his intent to destroy Israel. (5,149) Arab support poured forth and soon Israel was

ringed by a combined Arab force of 250,000 troops, more than 2,000 tanks and some 700 front line combat aircraft (5,149). Meanwhile, beginning in mid-May, Israel's citizen army was quietly and efficiently mobilized to defend the country against the impending Arab attack which was being reported in virtually all Arab media. (5,151) This set the stage for Israel's dramatic preemptive attack.

Beginning at 0745 hours on 5 June, and for the next three hours, the Israeli Air Force systematically obliterated the Egyptian Air Force and its airfields. Nineteen Egyptian bases in the Sinai, the Nile delta, the Nile valley, and the Cairo area were attacked by some 500 sorties, destroying 309 of 340 serviceable aircraft (5,152). It was an attack for which the Israeli Air Force had trained and prepared in detail in order to produce the precise performance by pilots, aircraft and ground support personnel necessary to achieve success (1,55). After the strikes against the Egyptian Air Force, and in response to minor attacks by Jordanian, Syrian and Iraqi Air Forces, Israel turned to face its other Arab neighbors. By evening, the Jordanian Air Force was wiped out and the Syrian Air Force had only one third of its original air combat capability remaining (5,153). Also, all Egyptian radar stations in the Sinai and most of those in the Delta and canal zones had been destroyed, and Israel had

almost total command of the skies. By the following evening, 6 June, a total of 416 Arab aircraft had been destroyed -- 393 of them on the ground -- at a cost of only 26 Israeli aircraft lost (5,153).

The surprise on which the Israeli's had counted was utterly complete. "To the Arabs, the devastating power of the Israeli attack was as stunning as the surprise with which it took place." (1,55) Thereafter, the Israeli Air Force, with complete command of the air, was free to commit totally to the close support mission for its ground forces.

> It was the preemptive attack by the Israeli Air Force which formed the key to their success in the land battles which were to follow. Possibly they would still have won the war without this massive air assault, but victory could have entailed many more Israeli casualties and it would have taken much longer than six days. (1,55)

A number of interesting issues and insights emerge from the review of this action. The question as to whether the Israeli strike was strategic or operational offers the basis for a spirited debate, but one that need not be detailed here. In my view, the preemptive aerial strike was a major operation, and component of the Israeli campaign to defeat the Arabs -- therefore operational in nature. The important result is that the application of firepower in the strike produced results that had dramatic operational significance. Once again it is noted that the application of firepower was not decisive -- an entire

land campaign followed before the war was decided. The issue of integrating the application of firepower at the operational level with the overall operational concept is in evidence.

Although the vignette does not specifically identify the operational commander or the process used to effect integration, some reasonable conclusions may be drawn. In this instance the integration of fires with the remainder of the operational concept was clearly a matter of sequencing -- a legitimate and normal operational level function. The concept called for the application of aerial firepower to gain air supremacy prior to the outbreak of ground hostilities, in order that Israeli ground forces would have the full weight of Israeli Air Force capability in close support during the ground battle, and with virtually no threat from Arab air power.

With the journey through theory and history now complete, it remains to consolidate the emerging consistencies in order to establish the essence of operational fires. An issue suggested at the outset questioned the general utility of fires as an operational level consideration. An unambiguous thread extending throughout the theory and historical vignettes would indicate that fires are a legitimate and important consideration at the operational level. This notion is accommodated in classical theory via

positions taken by Clausewitz and Sun Tzu, and strongly supported in more contemporary thought represented in the writings of Marshalls Tukhachevskii and Triandafilov, and of Generals Rogers and von Sandrart, and in each of the selected historical experiences.

Recalling the Reece definition of operational fires (page 17), with the benefit of theoretical and historical insights into the application of fires at the operational level, several issues seem to surface. Per that definition, operational fires have "decisive impact", are "integrated with maneuver at the operational level", and serve one of three stated purposes. Each of these propositions will be subsequently addressed in turn.

We have seen the achievement of major, operationally significant impact through massed fires, as espoused by Douhet and Mitchell and as demonstrated in Operation Cobra, and in the Vistula-Oder Campaign. Similar impact achieved through detailed analysis, precision targeting and fires was espoused by the Air Tactical School, Rogers and von Sandrart and was demonstrated in the Vistula-Oder "fire strike" and the 1967 Israeli preemptive strike. Although Douhet and Mitchell would disagree, Clausewitz would argue the operational fires, while they may contribute much to the ultimate outcome, will not be decisive. The history we have examined bears this out.

Regarding the "integration of fires with maneuver at the operational level", there is a divergence of views. Clearly, Douhet and Mitchell support independent "campaigns" in application of fires, while von Sandrart argues vehemently for complete coordination of the planning and execution effort by the maneuver commander. Given the complementary nature of fires and maneuver in the context of "cheng" and "ch'i", Sun Tzu would support the notion that the commander retains an important coordination role for each. In the history we have seen examples of detailed planning and integration of what have been called operational fires with maneuver in the Operation Cobra and Vistula-Oder vignettes. We have also seen two examples where the "integration" was achieved at the operational level simply by sequencing operations -- the Transportation Plan et al and the Israeli preemptive strike. It seems that "integration with maneuver" may be too strong and restrictive an assertion -- rather integration with the commander's operational concept serves to accommodate not only requisite coordination with maneuver, but also logistics, electronic warfare, deception, special operations forces, and the myriad of other components of the concept, as well as allowing for independent but directed application of firepower when appropriate.

The Reece definition proposes that operational

fires serve one or more of the following purposes:

1) Facilitation of operational maneuver

2) Interdiction of forces not yet joined in battle

3) Destruction of critical enemy facilities and/or functions.

Each of these purposes has basis in both theory and history established in this study, is thereby indisputably characteristic of operational fires, and therefore useful in describing the nature of such fires. However, listing them as part of a definition of operational fires is too restrictive -- there may well be other suitable purposes for such fires. The role of operational fires in a deception is but one example.

An issue implied but not stated in the analysis to this point is the belief that operational fires will most often be the product of joint and/or combined operations. As such, it becomes crucial that the operational commander specify the high impact, operationally significant results he intends to realize via operational fires. Only by doing so will the requisite tasking, responsiveness and synchronization of the disparate organizations and systems executing the intelligence, targeting and attack functions be feasible.

With all the preceding theory, history and analysis as a backdrop and basis, the following

definition is proposed:

> **<u>Operational Fires</u> are defined as the application of firepower, often the product of coordinated joint and/or combined effort, directed by the operational commander as a fully integrated component of his campaign plan (operational concept), with design and intent to achieve a specified, high impact, operationally significant result through focussed intelligence and targeting and effective massed and/or precision fires.**

A review of this definition against the criteria established for suitability at the outset confirms its merit. The logical development in this paper uses, as its basis, insights gleaned from four selected historical vignettes. As has been demonstrated, the proposed definition is derived directly from that development. Theorists from Sun Tzu and Clausewitz through Douhet and Mitchell to the contemporary thoughts of von Sandrart and Rogers suggest, and the selected historical examples all confirm, that the commander's role in the successful application of firepower at the operational level is vital. The commander's vision of the impact, both desired and necessary, of the application of firepower in order to achieve or contribute to the accomplishment of his operational intent, and, by his direction, the focussing of the concerted efforts of his forces toward that end are arguably the key ingredients in successfully applying firepower at the operational level. This relationship of the product (operational fires) with the commander and his operational intent is

absent in other definitions of operational fires, and yet it stands out from theory and history as the common thread leading to success. The final criteria to be established is the uniqueness of operational fires -- the demonstration of fundamental differences between operational fires and other doctrinal fires.

Categorically, other doctrinal fires include fire support, interdiction and Follow-on Force Attack (FOFA). A fundamentally important distinction between operational fires and fire support is the direction of work flow from planning to execution. In formal fire support, planning has its origins at the tactical level, often beginning at maneuver company or platoon, with execution at brigade or a higher tactical level--a bottom up process.(32,4-6) Operational fires, per the definition, originate with the operational commanders concept, and are executed at his direction, normally by long range assets under his control(32,4-6) -- a top down process.

Interdiction has as its objective the destruction, delay, disruption or diversion of enemy surface military potential before it can be used effectively against friendly forces (25,II-1). While this is consistent with the concept of operational fires, its scope is clearly more narrow. Also, with the assertion that "Synchronization of interdiction operations with the theater commander's scheme of maneuver **can** enhance

the effects of interdiction"(25,I-3), it is clear that interdiction is intended for roles and purposes which extend outside those encompassed by the tight relationship between operational fires and the operational commanders concept for those fires.

FOFA is generally regarded as a subset of interdiction (26-I1) and is defined as an operational focus for interdiction that brings intense firepower and other capabilities to bear against a specific force objective to achieve a specific result over a specified time period. (26-I1) It is an operational level interdiction concept, designed to break the momentum of attacking enemy echelons prior to their engagement with defending ground forces in close operations.(26,I-1) I submit that FOFA constitutes operational fires, but only in a narrow, defensive context. We have seen examples of operational fires in offensive operations which are quite distinct from FOFA. Thus, operational fires are indeed distinct from other doctrinal fires, with a relationship to the others as depicted in the diagram at inclosure 4. And, the proposed definition has been demonstrated to meet established criteria for suitability.

Since

> Operational art is the vital link between strategic aims and the tactical employment of forces on the battlefield. Without operational purpose and direction, war is reduced to a set of disconnected engagements, with relative attrition the only measure of success or failure.

> Operational art disciplines the application of military effort, seeking to ensure that every expenditure of men, materiel and time achieves the strategic aim. In its simplest expression, operational art determines when, where and for what purpose major forces will fight.
> (29,vii)

it seems clear that operational fires, as defined herein, have a profoundly important role to play.

If we accept this definition and the logic which supports it, a number of issues and implications evolve, any or all of which merit further study and consideration. The first of these involves the fact that there is no operational level analog to the doctrinal Fire Support Coordinator (FSCOORD) which exists in force structure through Army corps level. Thus, there is no designated individual to assume staff responsibility for the planning and execution of operational fires. The questions of whether such an individual is required, and if so, what he is to do, how he is to do it, and by what or whose authority need resolution. This is a particularly interesting question considering the scope, both joint and combined, of operational level activity.

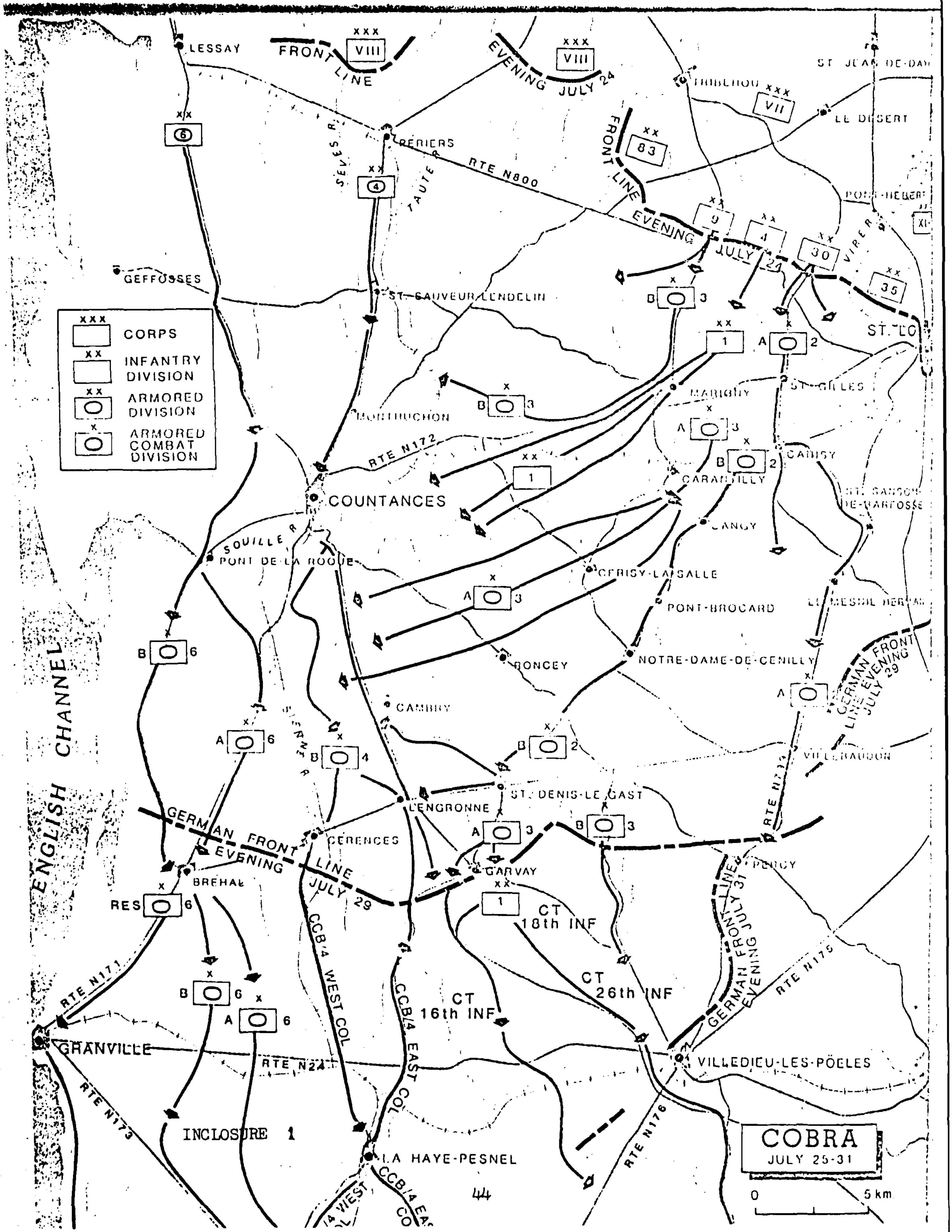
In a related issue, it seems that the individual responsible to the operational commander for his operational fires would be best served by the support of a joint and/or combined staff, as appropriate to the command. Rationale for this notion includes the requirement for a suitable, functional communications

architecture and interoperability, as well as broad staff insights into the structure and capabilities of all organizations and systems within the command. And yet draft joint doctrine suggests that responsibility for joint fires (interdiction, in particular) is to be given to a component commander (and, by implication, his component staff). Recognizing that joint staffs and the human and materiel resources to constitute them are finite and scarce, it is critically important to carefully consider what access, support and resources will be required in prosecuting the commander's operational fires, and select and provision the responsible agent accordingly. More definitive work in this area is essential to make operational fires viable.

The final implication which I would highlight involves the linkage inherent between the operational commander's vision of the role of operational fires in his campaign and the intelligence and targeting effort supporting the campaign. Clearly, if operational fires are to produce the intended high impact results, focussed, timely intelligence and target information will be required. Given the joint and/or combined environments in which operations will be conducted, the inherent resistances and inefficiencies in delivering such products, and the layers and processes through which products must in general pass, there seems to be

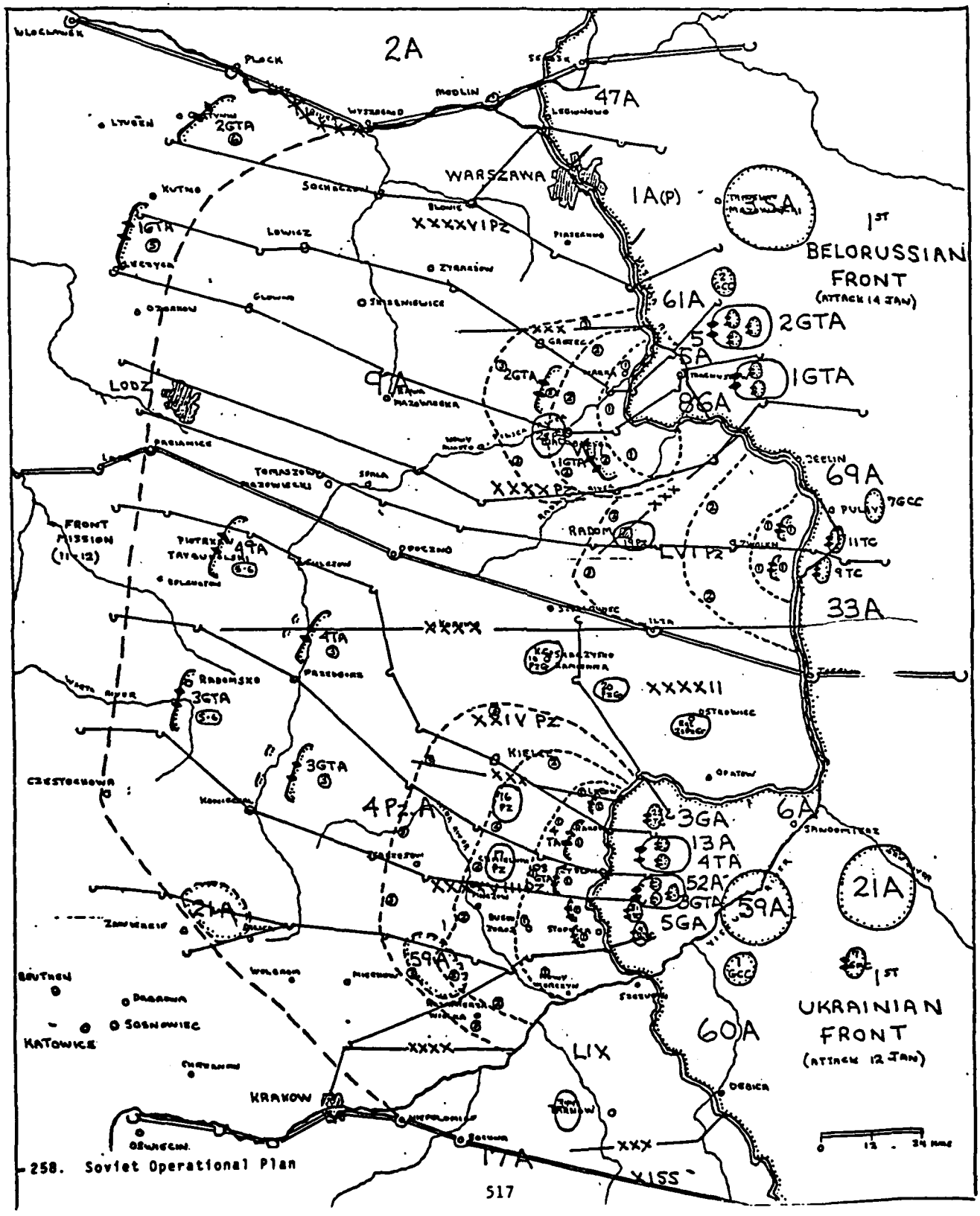
legitimate concern about the production of intelligence and targeting information with sufficient accuracy and timeliness to support operational fires. This concern is only heightened unless the operational commander provides focus and direction to his intelligence and targeting assets in order to assure their support of his concept for operational fires. This is yet another area which begs detailed study and analysis.

While these three issues are significant problems, with their "optimal" resolution being subjectively determined to at least some extent, it is nonetheless important that each be resolved. The very viability and executability of the concept of operational fires, now defined with some precision, is at stake. And both theory and history attest to the utility of the concept of operational fires for the operational level commander. Would you not agree?


COBRA
JULY 25-31
0
5 km
CORPS
INFANTRY DIVISION
ARMORED DIVISION
ARMORED COMBAT DIVISION
ENGLISH CHANNEL
LESSAY
FRONT LINE
VIII
EVENING JULY 24
VII
83
FRONT LINE
EVENING JULY 24
PERIERS
RTE N800
SEVES R.
TAUTE R.
6
4
9
30
35
VIRE R.
LE DESERT
ST. LO
GEFFOSSES
ST. SAUVEUR LENDELIN
MARIGNY
ST. GILLES
RTE N172
COUNTANCES
SOUILLE R
PONT DE LA ROQUE
CARANTILLY
CERISY-LA-SALLE
PONT-BROCARD
RONCEY
NOTRE-DAME-DE-CENILLY
CAMBRY
GERMAN FRONT LINE EVENING JULY 29
ST. DENIS-LE-GAST
L'ENGRONNE
CERENCES
BREHAL
GARVAY
GERMAN FRONT LINE EVENING JULY 29
RES
CT 18th INF
CT 26th INF
CT 16th INF
CCB/4 WEST COL
CCB/4 EAST COL
RTE N171
GRANVILLE
RTE N24
RTE N173
RTE N175
RTE N176
GERMAN FRONT LINE EVENING JULY 31
PERCY
VILLEDIEU-LES-POELES
LA HAYE-PESNEL

INCLOSURE 1

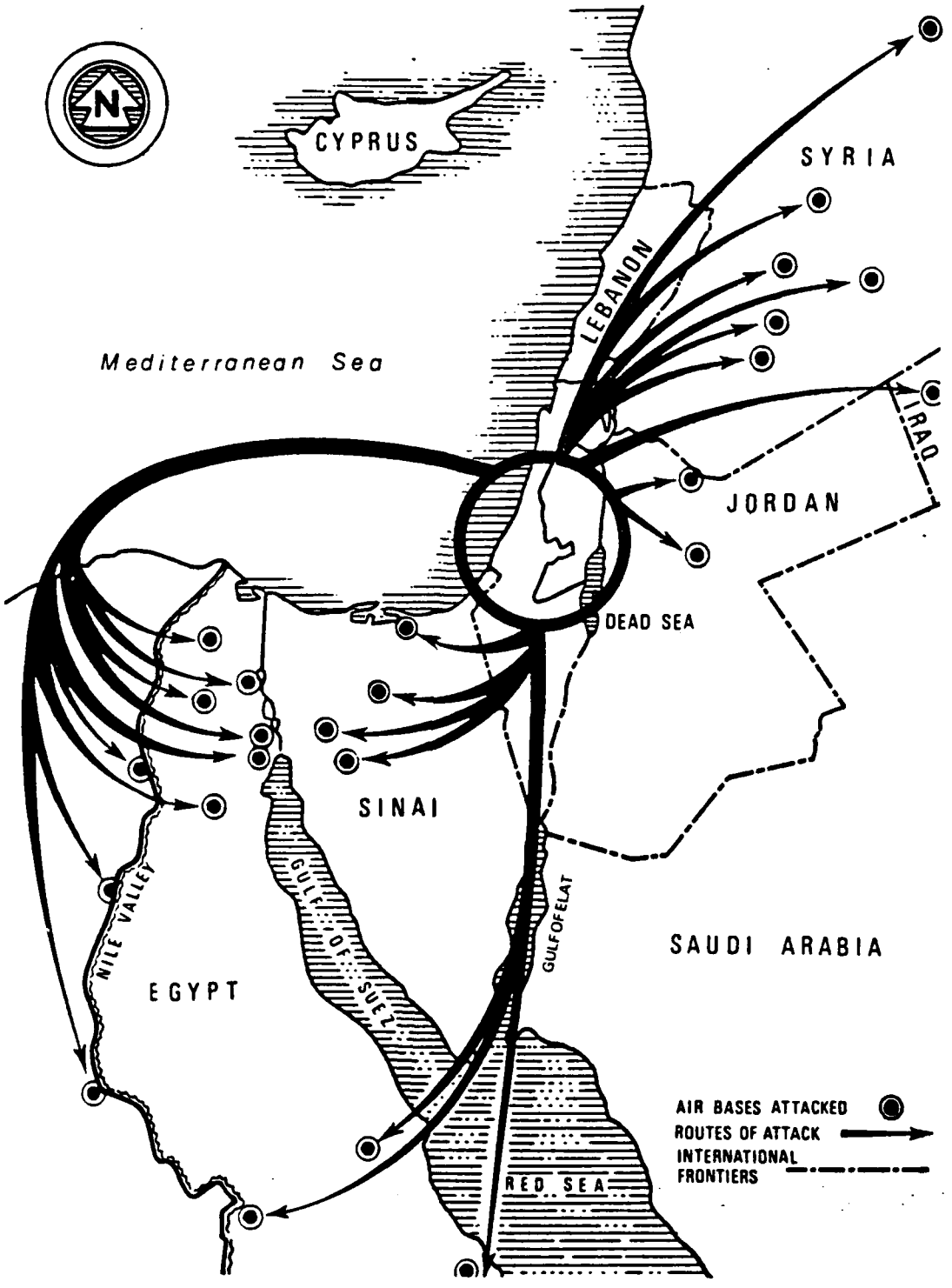
SOVIET OPERATIONAL PLAN



258. Soviet Operational Plan

INCLOSURE 2

Israeli Air Force strikes, 5 June 1967.



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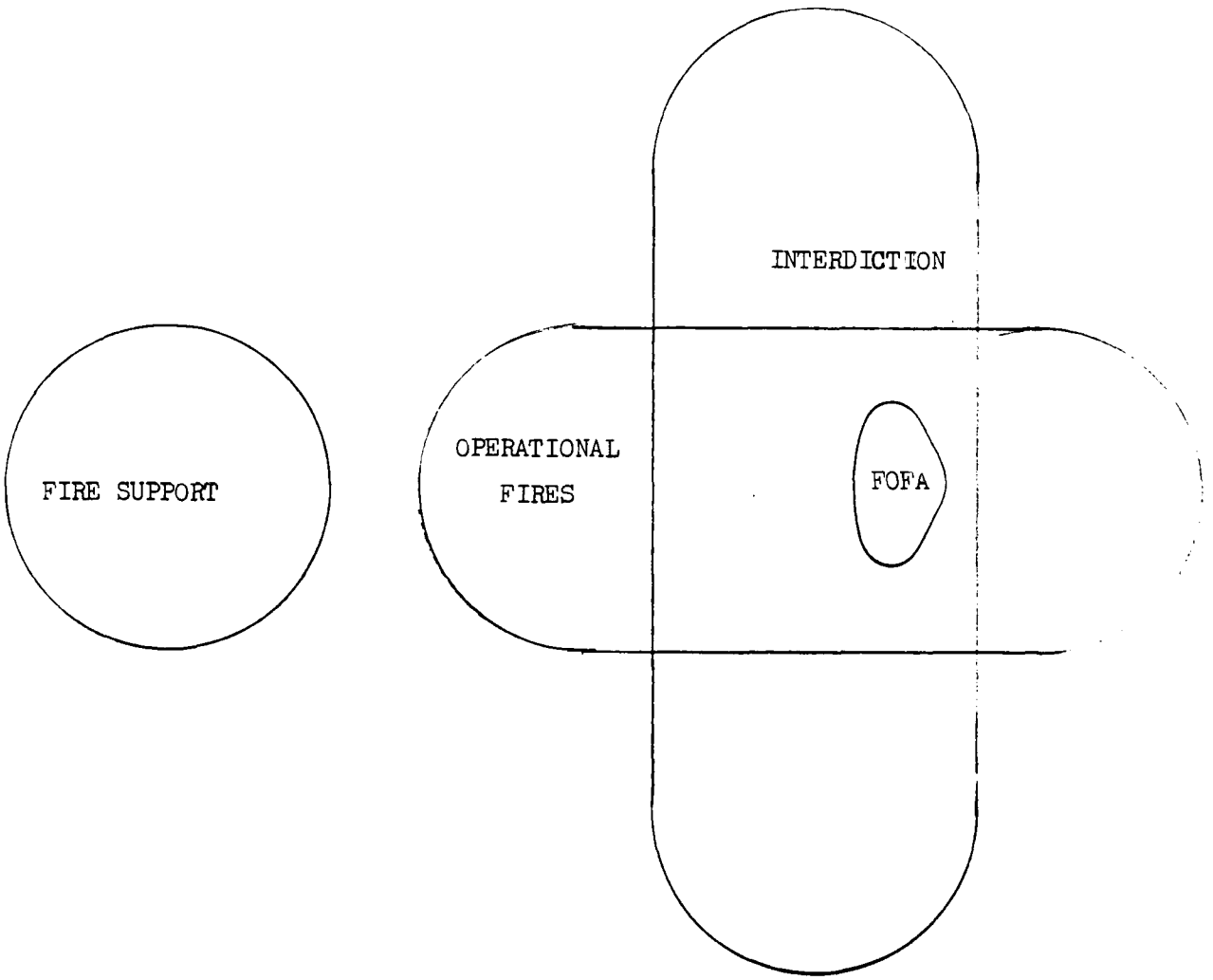
INCLOSURE 3



INCLOSURE 4

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